International Journal of
Science, Architecture, Technology and Environment

Impact of Consumer Behaviour on Firecracker Purchase

Rakesh Chakravarthi T.[1*], Dr. Geetha Joshi[2]

[1]*Student (PGDM), Dayananda Sagar Business School, Bengaluru, India*

[2]*Assistant Professor, Dayananda Sagar Business School, Bengaluru, India*

[*]*Corresponding author*

DOI: https://doi.org/10.63680/ijsate05251270.26

Abstract

The study examines the changing consumer behavior towards the buying of firecrackers and how cultural practices, environmental factors, policy environments, and market forces interact to shape consumer purchasing. Though firecrackers are firmly rooted in festivities and religious activities, growing awareness of the environmental and health impacts has had an effect on consumption, especially among the youth and urban populations. Conducted with a mixed-methods research design, the study interviewed 300 participants and carried out interviews to measure motivations, levels of awareness, and behavior change. The research finds that while environmental sensitivity and regulatory forces are increasing, cultural affinity is still a significant mover of firecracker demand. The research observes regional and demographic differences in consumer behavior, detects an upward trend in shifting to eco-friendly options, and highlights the necessity for focused awareness programs and policy intervention. It provides useful recommendations for companies, governments, and environmentalists seeking to reconcile tradition and sustainability in celebratory activities.

Keywords: Consumer behavior; Firecrackers; Environmental awareness; Cultural practices; Eco-friendly alternatives

I. INTRODUCTION

Firecrackers have been an integral part of celebrations in various cultures worldwide, symbolizing joy, festivity, and prosperity. However, in recent years, changing consumer attitudes driven by safety concerns, environmental awareness, and evolving regulations have altered purchasing behaviours. This study aims to understand the key drivers influencing firecracker purchases and how different factors such as tradition, affordability, safety measures, and government policies impact consumer decisions.

A. Background Information

Firecracker sales are primarily influenced by cultural traditions, where they are used to mark special occasions like Diwali, weddings, and national celebrations. Despite their popularity, concerns regarding noise pollution, air quality, and fire hazards have led to increased restrictions in many regions. While some consumers continue purchasing traditional firecrackers, others seek safer and eco-friendly alternatives, such as green crackers or digital light displays.

Additionally, the firecracker industry contributes significantly to local economies, providing employment opportunities in manufacturing and sales. However, as regulatory frameworks evolve, businesses must adapt to new consumer preferences while ensuring compliance with environmental and safety norms. This study aims to explore these evolving dynamics and their impact on market trends.

Moreover, media coverage and awareness campaigns have played a crucial role in shifting public perception regarding firecrackers. Many advocacy groups and environmental organizations have raised concerns over the long-term effects of firecracker pollution on air quality, human health, and climate change. The rise of consumer activism has also led to an increasing demand for sustainable and responsible celebratory alternatives, making it essential to analyse how awareness influences purchasing behaviours.

B. Research Problem

Despite the deep-rooted tradition of firecracker usage, changing regulatory landscapes and increased awareness of their negative impacts have created a shift in consumer preferences. There is a lack of empirical research investigating how these factors collectively impact purchasing decisions. Are cultural influences stronger than environmental concerns? How do affordability and regulatory constraints affect consumer choices? What role does consumer education play in shaping new purchasing trends? These are the key questions this research aims to explore.

Furthermore, previous studies have largely focused on isolated aspects, such as pollution concerns or regulatory impacts, without providing a comprehensive analysis of the interplay between cultural sentiments, economic factors, and environmental responsibility. A deeper understanding of these variables is necessary to develop balanced policies that accommodate both traditional values and sustainability efforts.

C. Significance of the Research

This research is significant for various stakeholders:

Businesses: It helps firecracker manufacturers and retailers understand consumer behaviour and tailor marketing strategies accordingly. Understanding shifts in consumer preferences allows for better product diversification, catering to traditional buyers as well as those seeking eco-friendly alternatives.

Policymakers: Understanding consumer attitudes helps design better regulations that balance cultural significance with environmental responsibility. Insights from this study can inform decisions on legal restrictions, compliance guidelines, and incentives for green alternatives.

Environmental Organizations: Data on consumer behaviour can help design awareness campaigns that encourage responsible firecracker use. Understanding public perceptions of environmental impact can guide strategies for promoting sustainable alternatives.

Consumers: By understanding the broader impacts, consumers can make informed purchasing decisions, balancing tradition with environmental consciousness and safety considerations.

The study also aims to inform retailers and market players about emerging consumer preferences, enabling them to adjust supply chains and distribution strategies accordingly. Additionally, it can provide insights into consumer willingness to adopt alternative celebration methods, such as laser light shows and silent fireworks, which could offer viable substitutes while maintaining festive spirits.

D. Objectives of the Study

To analyse consumer motivations behind firecracker purchases. To evaluate the impact of environmental awareness on purchase decisions. To assess the role of government regulations in influencing consumer behaviour. To identify emerging trends in eco-friendly alternatives.

To provide recommendations for businesses and policymakers to balance tradition and sustainability. To examine the economic impact of shifting consumer preferences on local businesses and labour markets. To explore consumer willingness to adopt alternative celebration methods such as laser shows or silent fireworks. To assess how media coverage and awareness campaigns influence firecracker purchasing behaviours.

E. Scope of the Study

The study will focus on consumer behaviour across different demographics, considering factors such as cultural attachment, affordability, safety concerns, and regulatory impact. A comparative analysis between urban and rural consumers will also be conducted to assess variations in purchase behaviour.

Additionally, the study will investigate consumer awareness regarding alternative celebration methods, including digital light shows and environmentally friendly firecrackers. The research will also assess how media campaigns, educational initiatives, and government interventions shape consumer perceptions over time.

This study will incorporate both qualitative and quantitative research methods, ensuring a comprehensive understanding of evolving trends. Primary data collection will include surveys and interviews with diverse consumer segments, while secondary data will be drawn from market reports, academic studies, and governmental policy reviews.

By examining data from diverse geographic and socioeconomic backgrounds, this study aims to provide a holistic understanding of how firecracker purchasing patterns are evolving and what the future holds for this traditional yet controversial industry.

II. Literature Review

Overview

Several studies highlight the evolving perception of firecrackers, emphasizing safety concerns, environmental effects, and cultural traditions. Research has shown that:

- Firecrackers contribute significantly to air and noise pollution (Sharma et al., 2019). Studies reveal that fireworks release harmful pollutants such as sulphur dioxide, carbon monoxide, and particulate matter, significantly degrading air quality, especially in densely populated areas. Additionally, the high decibel levels from firecrackers cause noise pollution, which affects both human health and wildlife. Prolonged exposure to loud noise can result in hearing impairments, increased stress levels, and disrupted sleep patterns.

- Consumer awareness of these environmental effects is increasing (Gupta & Sinha, 2019). Public concern over the detrimental effects of firecrackers is growing, leading to increased advocacy for sustainable celebrations. Media campaigns, governmental restrictions, and awareness programs have played a crucial role in educating consumers about the long-term consequences of firecracker usage. Surveys indicate that younger generations, in particular, are more conscious of the environmental impact and are open to alternative forms of celebration.

- Firecracker bans and eco-friendly alternatives are gaining traction (Liu et al., 2021). In response to rising

environmental concerns, many governments have imposed partial or complete bans on traditional firecrackers. Some regions have promoted the use of green firecrackers, which claim to reduce emissions by up to 30%. Additionally, alternative visual celebrations, such as drone light shows and laser displays, are being adopted in urban areas as sustainable replacements for traditional fireworks.

Key Theories

1. Consumer Behaviour Theory:

This theory explains how external factors, such as cultural influences, environmental awareness, and regulatory policies, shape consumer purchasing decisions. Studies indicate that while traditional values strongly influence firecracker purchases, modern concerns such as pollution, safety hazards, and government policies increasingly play a role in shifting consumer behaviour. Consumers are often driven by perceived social norms, where continued firecracker use is seen as an integral part of festivities, despite growing concerns.

2. Sustainable Consumption Model:

The transition toward sustainable purchasing behaviour is driven by growing consumer consciousness regarding environmental degradation. The Sustainable Consumption Model highlights how increased knowledge and availability of eco- friendly alternatives can shift consumer preferences. Research by Gupta & Sinha (2019) suggests that when sustainable firecrackers are marketed effectively and priced competitively, consumers are more likely to adopt them. However, the transition is slow due to the deep-rooted cultural significance of traditional firecrackers.

3. Regulatory Compliance and Social Responsibility:

This framework examines how government regulations, enforcement measures, and corporate social responsibility initiatives impact firecracker consumption. Studies indicate that areas with strict regulations and penalties witness a noticeable reduction in firecracker-related pollution. Furthermore, many firecracker manufacturers are now exploring less polluting alternatives as part of their corporate responsibility initiatives. Campaigns promoting safe and environmentally responsible celebrations have played a pivotal role in encouraging behavioural changes among consumers.

Gaps in Literature

Despite extensive studies on consumer behaviour and the environmental impact of firecrackers, several gaps remain:

- Long-Term Influence of Regulations:

While bans and restrictions on firecrackers have been implemented in various regions, there is limited research on their long-term effectiveness. Understanding whether such measures lead to lasting behavioural changes or temporary compliance remains unclear.

- Effectiveness of Eco-Friendly Firecracker Campaigns:

Research is needed to evaluate the success of promotional campaigns encouraging eco-friendly alternatives. Many consumers remain skeptical about the authenticity and performance of green firecrackers, which affects their adoption rates.

- Economic Impact on Local Industries:

A decline in firecracker sales due to environmental awareness and regulations affects local economies, particularly in regions where firecracker manufacturing is a major industry. There is a need for studies exploring how businesses can transition toward producing sustainable alternatives without significant financial losses.

- Comparative Analysis of Consumer Behaviour in Urban vs. Rural Areas: While urban consumers are more exposed to sustainability awareness campaigns, rural consumers may still rely heavily on traditional firecrackers due to cultural influence and lack of awareness. Research comparing urban and rural adoption rates of eco-friendly firecrackers is necessary to design targeted awareness programs.

This study aims to bridge these gaps by providing a comprehensive analysis of how shifting consumer awareness, government policies, and cultural traditions collectively influence the purchasing behaviour of firecrackers.

III. Research Methodology

A. Research Design

The research adopted an exploratory research design to analyse consumer behaviour toward firecrackers, particularly focusing on factors influencing purchasing decisions. This approach was chosen to investigate the complex interplay between traditional practices, safety concerns, and the growing awareness of environmental impacts. The mixed-methods approach integrates both qualitative and quantitative methods, allowing for a comprehensive exploration of the research problem. The quantitative component involved a structured survey to gather numerical data on consumer attitudes, while the qualitative component included interviews to gain deeper insights into personal motivations, perceptions, and decision-making processes.

B. Data Collection Methods

Data collection was divided into two primary streams:

1. Primary Data: The primary data was collected using structured questionnaires distributed to 300 respondents. The survey included questions designed to capture key variables such as environmental awareness, cultural importance, price sensitivity, and safety concerns. The survey targeted consumers who regularly purchase firecrackers, providing firsthand insights into their motivations and behaviour. In addition, qualitative interviews were conducted with selected respondents to deepen the understanding of their preferences and attitudes.

2. Secondary Data: Secondary data was sourced from academic research papers, industry reports, and previous studies on fireworks consumption, environmental impact, and regulatory frameworks. This data was essential for contextualizing the study within the broader field of consumer behaviour and sustainability research.

C. Sampling Method

The research employed a stratified random sampling method to ensure the sample reflected a broad cross-section of the population. This method involved dividing the target population into subgroups (strata)

based on key demographic variables such as age, income, gender, and geographic location. By doing so, the study ensured that responses were representative of diverse groups, making the results more generalizable. The sample included individuals from both urban and rural areas who actively participate in firecracker purchases, allowing the research to capture a wide range of perspectives.

D. Data Analysis Techniques

1. Descriptive Statistics: Descriptive statistics were used to summarize and organize the data collected from the survey. Metrics such as frequency, mean, and standard deviation helped describe the central tendencies and distribution of responses. These statistics provided a clear overview of consumer attitudes toward firecrackers, including common concerns about safety and environmental impact.

2. Correlation Analysis: This technique was used to explore the relationships between key variables. Specifically, correlation analysis assessed how factors such as environmental awareness, safety concerns, and cultural significance influenced consumers' purchase intentions. For instance, the analysis examined whether heightened awareness of pollution correlated with a reduction in firecracker purchases.

3. Regression Models: To further understand the impact of multiple factors on purchasing decisions, regression analysis was conducted. This statistical method allowed the research to evaluate how independent variables (such as price sensitivity, cultural traditions, and environmental awareness) affected the dependent variable (purchase behaviour). The models provided insights into the strength and significance of each factor, revealing the most critical influences on consumer behaviour.

IV. Results

1. Impact of Awareness on Purchasing Decisions

- 67% of respondents acknowledged concerns about the environmental impact of firecrackers. However, despite their awareness, they continued to purchase them, indicating that cultural traditions and personal enjoyment still play a significant role in consumer behaviour.
- Awareness campaigns and educational initiatives have had a moderate impact on reducing purchase intent. While some individuals have shifted toward eco-friendly alternatives, many still prioritize celebrations and traditions over environmental considerations.
- Consumers who received detailed information about the negative effects of firecrackers on air quality, health, and noise pollution were 20% more likely to reconsider their purchasing decisions compared to those who lacked such information.
- The data suggests that while awareness is growing, it does not directly translate into a significant reduction in firecracker purchases. More aggressive awareness campaigns combined with regulatory enforcement may be required to drive meaningful change.

2. Effect of Regulations

- 45% of consumers reported that government regulations and restrictions had influenced their purchasing behaviour, with many citing stricter laws as a reason for reducing firecracker usage.
- In urban areas, where enforcement is more stringent, there has been a noticeable decline in firecracker sales due to the fear of penalties, fines, and increasing social pressure to adopt environmentally conscious behaviours.

- Despite the enforcement of firecracker bans in certain regions, illegal sales and black-market purchases have emerged as challenges, highlighting the need for better implementation and monitoring mechanisms.
- In rural areas, where regulatory enforcement is comparatively weaker, firecracker sales remain largely unaffected, with only 22% of respondents acknowledging any change in purchasing behaviour due to government policies.
- Overall, while regulations are effective in reducing sales in metropolitan regions, their impact is inconsistent across different demographics and locations.

3. Consumer Segmentation

- Younger Consumers (15-25 years):
  - More inclined toward eco-friendly alternatives such as silent fireworks, laser shows, and biodegradable crackers.
  - Social media and peer influence play a major role in shaping their perceptions and purchasing decisions.
  - 60% of respondents in this age group expressed a willingness to switch to sustainable options if they were made more affordable and accessible.
- Middle-Aged Consumers (25-40 years):
  - Prioritize tradition but also acknowledge regulatory constraints and environmental concerns.
  - Likely to reduce but not completely eliminate firecracker usage, opting for lower quantities or eco-friendly versions.
  - 35% of this demographic reported a shift in buying patterns due to societal and legal influences.
- Older Consumers (40+ years):
  - Least affected by environmental concerns and most resistant to change in firecracker usage.
  - More likely to view firecrackers as an inseparable part of cultural and religious celebrations.
  - Only 18% of respondents in this age group considered reducing firecracker consumption due to regulations or awareness campaigns.

The results highlight that while awareness and regulations influence consumer behaviour to some extent, cultural significance and tradition remain dominant factors in firecracker purchases. Younger generations are more receptive to change, while older demographics are less likely to alter their purchasing habits. Regulatory measures have had varying impacts depending on enforcement strength and regional differences, suggesting the need for a combination of awareness initiatives, policy implementation, and eco-friendly product innovations to drive significant behavioural shifts.

V. Discussion

A. Interpretation of Results

The study provides a comprehensive analysis of consumer behaviour regarding firecracker purchases,

highlighting key influencing factors such as cultural traditions, environmental consciousness, and safety concerns. The findings indicate that while cultural significance remains a dominant factor in consumer choices, there is an evident shift toward sustainability, particularly among younger demographics. Urban consumers are increasingly influenced by environmental awareness and government regulations, leading to a noticeable decline in traditional firecracker usage. Conversely, rural consumers, who often have stronger cultural ties to firework traditions, continue to exhibit greater adherence to conventional firecracker use. However, even within rural demographics, a slow yet growing interest in eco-friendly alternatives suggests that awareness campaigns and policy interventions are beginning to have an impact.

Furthermore, safety concerns play a significant role in shaping consumer decisions, particularly in urban areas where the risks of fire hazards and air pollution are more pronounced. Many consumers express apprehensions about the harmful effects of firecracker emissions on air quality and public health, which discourages them from participating in large-scale firework celebrations. On the other hand, in regions where cultural festivities heavily rely on firecracker displays, traditional practices often outweigh these concerns, leading to continued usage despite growing awareness of the environmental and health risks.

B. Comparison with Existing Literature

The findings of this study align with previous research that highlights a decline in traditional firecracker use due to rising environmental consciousness and regulatory interventions (Nair & Thomas, 2021). Studies have indicated that consumers are becoming more informed about the negative effects of fireworks, leading to an increasing preference for alternative celebratory methods such as laser shows and community-driven light displays. However, despite this growing awareness, there remains a significant gap in the widespread adoption of alternative celebrations.

Unlike some previous studies that primarily focus on the negative environmental impact of firecrackers, this research highlights the intricate balance between cultural traditions and emerging sustainability trends. While many urban consumers actively seek eco-friendly firecracker options, the accessibility and affordability of such alternatives remain a challenge.

Additionally, unlike studies conducted in Western markets where stringent regulations have resulted in a significant reduction in firework sales, this study indicates that cultural attachment in Southern India still plays a substantial role in sustaining firecracker demand.

Another key finding that diverges from some existing literature is the contrast in consumer behaviour between rural and urban populations. While many prior studies have generalized firecracker consumption trends, this research underscores the importance of demographic differences, emphasizing that cultural influences are far more pronounced in rural areas compared to urban settings.

C. Implications and Limitations Implications:

- For Businesses: There is a growing market potential for eco-friendly firecrackers. Manufacturers and retailers can capitalize on this shift by investing in sustainable alternatives such as biodegradable fireworks and soundless displays. Developing innovative marketing strategies that emphasize the environmental benefits of eco- friendly firecrackers could help attract environmentally conscious consumers.

- For Policymakers: The study highlights the need for stricter regulations and targeted awareness campaigns to address safety concerns and environmental impacts. Implementing incentive programs for consumers who opt for sustainable celebrations and imposing stricter guidelines on firecracker sales could accelerate the transition toward eco-friendly alternatives.

- For Society: Community engagement and public awareness initiatives can help promote alternative celebrations. Encouraging the adoption of collective events such as public light displays and organized

firework-free festivities can reduce individual firecracker consumption while preserving the celebratory essence of festivals.

Limitations:

- Limited Regional Scope: The study focuses on specific regions, which may limit the generalizability of the findings. Consumer behaviour regarding firecracker purchases may vary significantly across different states and cultural contexts, requiring a broader study for more conclusive results.

- Reliance on Self-Reported Data: The study is based on survey responses, which may introduce biases such as social desirability bias, where respondents may overstate their preference for sustainable options while still engaging in traditional firecracker use.

- Lack of Longitudinal Data: The study captures current consumer trends, but a long- term analysis is necessary to assess whether the shift toward sustainability is a temporary trend or a lasting transformation. While cultural traditions continue to influence firecracker purchases, the growing awareness of environmental and safety concerns is leading to gradual shifts in consumer behaviour. Businesses and policymakers have a crucial role in accelerating this transition by promoting eco-friendly alternatives and enforcing stricter safety measures. However, addressing the challenges of affordability, accessibility, and cultural resistance remains essential to ensuring widespread adoption of sustainable celebrations. Future research should focus on expanding the geographical scope and analysing long-term trends to better understand the evolving consumer attitudes toward firecracker consumption.

VI. Conclusion

A. Summary of Key Findings

- Cultural Significance as a Key Driver: The study confirms that cultural traditions strongly influence consumer purchasing behaviour regarding firecrackers. Festivals, religious ceremonies, and social celebrations continue to sustain demand, reinforcing the deep-rooted role of firecrackers in society.

- Growing Environmental Awareness: Consumers are increasingly aware of the negative environmental effects of firecrackers, such as air and noise pollution. However, despite this awareness, sales figures remain largely unaffected. Many consumers prioritize cultural traditions over environmental concerns, indicating that awareness alone may not be enough to drive substantial behavioural change.

- Shift Toward Eco-Friendly Alternatives Among Younger Consumers: Younger demographics, particularly urban consumers, exhibit a growing inclination toward sustainable celebrations. They show a willingness to adopt eco-friendly alternatives such as green firecrackers, laser shows, and silent fireworks. This trend suggests a potential long-term transition in consumer behaviour, which could reshape the firecracker industry over time.

B. Contribution to the Field

This research provides valuable insights into the evolving dynamics of firecracker consumption and offers strategic direction for stakeholders in the firecracker industry.

- Guidance for Manufacturers and Retailers: The findings highlight the need for firecracker manufacturers and sellers to acknowledge shifting consumer preferences and explore more sustainable alternatives.

Companies that proactively develop and market eco-friendly products may gain a competitive advantage in the evolving marketplace.

- Implications for Policymakers and Regulators: The study underscores the importance of regulatory frameworks that balance cultural traditions with environmental sustainability. Policymakers can use these insights to craft policies that promote responsible firecracker usage, encourage innovation in green alternatives, and enhance public awareness initiatives.

- Enhanced Understanding for Environmental Advocates: The study reinforces the need for targeted awareness campaigns that emphasize both the environmental impact of firecrackers and the availability of viable, eco-friendly substitutes. Advocacy groups can leverage these findings to promote sustainable alternatives while respecting cultural sentiments.

C. Recommendations for Future Research

- Investigate the Long-Term Effects of Firecracker Regulations: Future studies should assess how different regulatory measures such as restrictions, awareness campaigns, and financial incentives—affect consumer behaviour over time. Understanding whether bans or regulations lead to sustained behavioural change or short-term compliance is crucial for shaping effective policies.

- Explore Innovative, Eco-Friendly Firecracker Alternatives and Consumer Adoption Trends: As the demand for sustainable celebrations grows, research should focus on alternative firework technologies, including biodegradable firecrackers, soundless pyrotechnics, and digital light displays. Additionally, studying consumer willingness to adopt these innovations will help manufacturers and policymakers navigate the transition toward more environmentally friendly celebrations.

By addressing these areas, future research can contribute to a more sustainable, culturally conscious approach to firecracker usage, balancing tradition with environmental responsibility.

Declaration of Conflicting Interests

The authors declare no potential conflicts of interest with respect to the research, authorship and publication of this article.

Funding

The author received no financial support for the research, authorship and publication of this article.

References

[1] Gupta, A., & Sinha, R. (2019). "The Environmental Impact of Fireworks: Assessing Air and Noise Pollution." Environmental Studies Review, 28(3), 110-122.
[2] Liu, H. M., et al. (2021). "Fireworks and Their Effects on Aquatic Ecosystems." Environmental Journal, 30(2), 145-159.
[3] Nair, M., & Thomas, J. (2021). "Changing Consumer Preferences in Festive Celebrations: The Role of Environmental Awareness." Consumer Behaviour Journal, 15(4), 90-102.
[4] Sharma, P., & Kumar, V. (2020). "Firework Safety and Regulations: A Global and Indian Perspective." Journal of Public Safety and Management, 12(1), 67-79.